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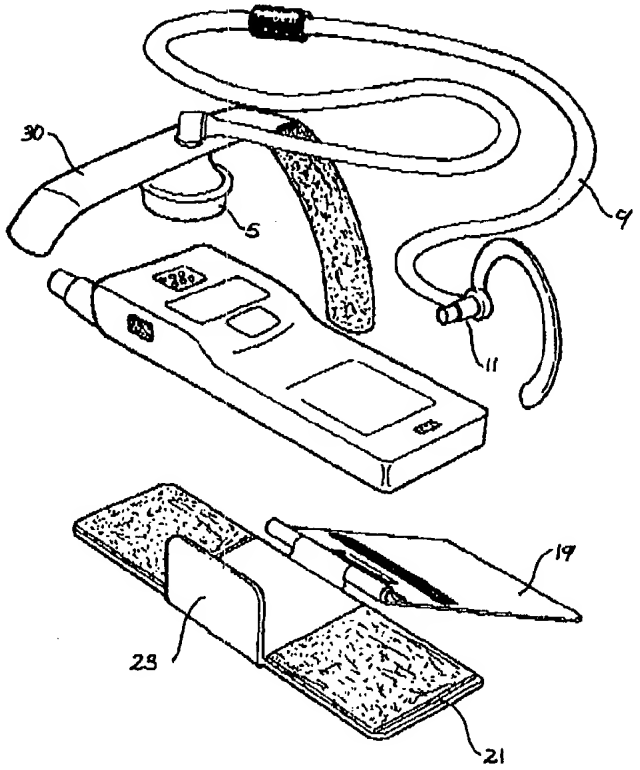
(54) Title: MOBILE PHONE ACCESSORY

(57) Abstract

An adaptor (1) to allow remote use of a telephone handset (7), said adaptor (1) including clamping means (3) to releasably clamp an audio receptor (5) adjacent a speaker outlet (6) on the telephone handset (7), and audio signal transmission means (9) terminating in a remote earpiece (11), such that, in use, sound from said speaker outlet (6) is transmitted to said remote earpiece (11) and wherein said adaptor (1) is adapted to be collapsible to facilitate storage and transportation.



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TITLE: **MOBILE PHONE ACCESSORY**

FIELD OF THE INVENTION

The present invention relates generally to hands-free support devices for telephones.

The invention has been developed primarily for use with portable and mobile phones and will be described hereinafter with reference to this application. It will be appreciated, however, that the invention is also applicable to conventional telephones.

BACKGROUND OF THE INVENTION

The recent rise of cellular or mobile phones throughout the industrialised world has seen a corresponding increase in the number of accidents arising from their misuse while driving. The distraction of speaking to another person is exacerbated when using a mobile phone, because the user only has one hand free to operate the vehicle controls. "Hands free" systems are becoming more common, although they tend to be relatively expensive due to the complicated electrical plugs, microphones and speakers associated with them. Another disadvantage is that the cradle used with such systems to hold the handset usually requires that a number of mounting holes be drilled through an interior surface of the car. The holes which remain after the cradle is removed, for example when the car is to be sold, are aesthetically displeasing and may have an impact on resale value. The permanent nature of such installations is a disadvantage where company or hired cars are involved, since the user is unable to easily transport the system from car to car.

It is an object of the present invention to overcome or at least ameliorate one or more of the disadvantages of the prior art.

DISCLOSURE OF THE INVENTION

Accordingly, the invention provides an adaptor to allow remote use of a telephone handset, said adaptor including clamping means to releasably secure an audio receptor adjacent a speaker outlet on the telephone handset, and audio signal transmission means terminating in a remote earpiece or speaker, such that, in use, sound from said speaker outlet is transmitted to said remote earpiece or speaker, and wherein said adaptor is at least partially collapsible to facilitate storage and transportation.

In one preferred embodiment the adaptor is configured for releasable engagement with a handset support unit including a platform for the handset and hook means to engage a space between an inner surface of a car window and an inner seal associated therewith such that the platform rests on the inner window sill. Preferably, the adaptor is releasably attachable to the handset support by means of hook and loop fastening.

In an alternative embodiment, the adaptor and the handset support unit are integrally formed.

It is preferred that the hook means is a tab hingedly mounted to an edge of the platform for limited rotation between a collapsed position resting against the platform for storage, and an operative position wherein further rotation is prevented such that, in use, the platform extends inwardly from the inner surface of the car window.

Preferably, the audio receptor includes an acoustic cup formation adapted for engagement with the speaker outlet and audio signal transmission means in the form of an acoustic tube extending from the acoustic cup formation to the earpiece.

Preferably, the clamping means comprise a generally 'C'-shaped bracket, having a pair of arms adjustable in spacing to suit a number of different handset sizes. More preferably, one of the arms of the 'C'-shaped bracket is slidably adjustable with respect to the other, and is held in the selected position by a grub screw assembly.

It is desirable that the bracket be collapsible for storage. Where the bracket is generally 'C'-shaped, one or both of the arms may be hinged so as to fold into overlapping relationship.

In an alternative embodiment, the clamping means comprises a flexible strap with appropriately positioned hook and loop fastening elements.

BRIEF DESCRIPTION OF THE DRAWINGS

Preferred embodiments of the invention will now be described, by way of example only, with reference to the accompanying drawings in which:

Figure 1 is a perspective view of an acoustic adaptor in accordance with the invention, in its generally operative condition;

Figure 2 is a perspective view of the acoustic adaptor shown in Figure 1, in a folded condition for storage;

Figure 3 is a perspective view of a handset support for use with the acoustic adaptor as shown in Figures 1 and 2, folded for storage;

Figure 4 is a perspective view of the handset support shown in Figure 3, in the operative configuration;

Figure 5 is an exploded perspective view showing an acoustic adaptor and handset support apparatus according to a second embodiment of the invention; and

Figure 6 is a cross sectional view showing a third embodiment of the invention.

PREFERRED EMBODIMENTS OF THE INVENTION

Referring to Figures 1 and 2, an acoustic adaptor 1 includes clamping means in the form of bracket 3 to clamp an audio receptor in the form of an acoustic cup 5 in sealing engagement with a speaker outlet 6 on telephone handset 7. The cup 5 includes an outlet port in fluid communication with the interior of an acoustic tube 9. The cup thus acts as an acoustic coupling between the speaker and the tube. The tube extends from the cup 5 to a remote earpiece 11, to transmit the audio signal in the form of pressure waves to the ear of the user.

Preferably, the acoustic adaptor is configured to be used with a handset support unit, such as that shown in Figures 3 and 4. The handset support 17 includes hook means in the form of a bracket or tab 19 which is designed to engage the space between an inner surface of a car window and an inner seal associated therewith. The handset support further includes a platform or base element 21 which in use is positioned in a generally horizontal orientation adjacent the inner window sill to hold the handset. The adaptor is releasably attachable to the handset support by means of hook and loop fastening (not shown), or other suitable means although in other embodiments the adaptor and handset support unit may be integrally formed.

Tab 19 is hingedly mounted to an edge of platform 21 for limited rotation between a collapsed position as shown in Figure 3, and an operative position as shown in Figure 4 wherein the tab extends downwardly from and perpendicular to the platform. In the preferred embodiment there is also provided a second locating tab 23 hingedly connected to an opposite edge of the platform or base to prevent the handset from sliding or rolling from the platform in use. In each case, the hinge is off-set from the plane of the platform 21, so that the tabs 19 and 23 can fold completely flat when not in use.

In the first embodiment shown, the clamping means takes the form of a generally 'C'-shaped bracket having a pair of arms adjustable in spacing to suit a number of different handset sizes, as best shown in Figure 2. Arm 4 is slidably adjustable with respect to the other fixed arm, and is held in the selected position by a grub screw 15. Once the handpiece is positioned correctly and clamping means 3 adjusted so as to clamp the acoustic cup 5 against the speaker outlet, the grub screw 15 is tightened, thereby locking the cup in position over the speaker. It will be appreciated, however, that the precise configuration of the clamping means is not critical. For example, in some cases, it may be more convenient to use a spring loaded clamping mechanism or other securing means to hold the cup against the speaker outlet.

The handset may also conveniently be clamped to the handset support by the acoustic adaptor. This may be achieved by hooking the arm 4 underneath the platform 21 and then clamping the acoustic cup 5 down onto the handset. In one form, there is provided fastening means such as hook and loop fastening elements or a clip to

releasably attach the arm 4 and thereby the acoustic adaptor 1 to the underside of the platform 21. By clamping the handset to the platform in this way, it is less likely to be bumped out of position in normal use, or to become a projectile during a collision. The invention can also include padding on any of the surfaces which come into contact with windows or painted surfaces such as the sill, thereby to prevent undesirable scratching.

Figure 5 shows an acoustic adaptor and a handset support apparatus according to a second embodiment of the invention, wherein corresponding features are denoted by corresponding reference numerals. It will be noted that in this case, the clamping means takes the form of a flexible strap 30. One side of the strap is lined with hook fastening material while the other side of the strap is lined with loop fastening material. It will thus be appreciated that by wrapping the strap 30 around the telephone handset, the complementary hook and loop fasteners on the overlapping ends of the strap are brought into contact, whereby the acoustic cup 5 is releasably and securely clamped in position against the speaker outlet of the phone. In one preferred form, the underside of the platform 21 is also lined with hook or loop fastening material 31 (see Figure 6). In this way, when the handset is placed on the platform 21 of the support unit, the strap 30 can be wrapped around the handset and the ends secured to the fastening material on the underside of the platform by engagement of the complementary hook and loop materials. Thus, the strap can be used simultaneously to locate the acoustic cup in position above the speaker and to secure the handset to the platform of the support unit. Advantageously, the hook or loop material on the underside of the platform also acts as an anti-scratch pad. In a further

variation, instead of the clamping strap 30 wrapping around the platform 21, the strap may be wrapped around the handset, and the hook or loop fastening material on the outside of the strap engaged with complementary hook or loop material 32 on the upper surface of the support platform, as shown for example in Figure 6. This arrangement has the advantage that the telephone handset can then be pulled from the platform when no longer required for use in the vehicle, without the need to remove the strap or the acoustic cup from the handset. Additional tabs of hook or loop fastening may also be provided with a self-adhesive backing, for adherence to the underside of the handset, and engagement with the complementary fastening material on the upper surface of the platform, for added security and stability.

To make a call, the user places the earpiece into his or her ear, and then uses the key pad on the handset in the usual manner. The user speaks towards the handset, whilst the earpiece enables the user to hear the other side of the conversation. In this way, the user is free to use both hands to manipulate the vehicle controls, yet is able to use the telephone easily and safely.

It will be appreciated, however, that the invention is not confined to use in vehicles. For example, when used without the handset support unit, the mobile telephone (or handset from a standard telephone) may be placed on a flat surface such as a desk, table-top, or even the user's lap. The user may then converse on the phone whilst maintaining use of both hands. This may be particularly convenient in a office environment.

Figure 6 shows a third embodiment of the invention, wherein again corresponding features are denoted by corresponding reference numerals. In this

embodiment, the clamping means takes the form of a flexible strap 30 with hook and loop fastening material on opposite sides, as described above. A cup formation 5 is also provided to act as an acoustic coupling. In this case, however, the acoustic coupling further includes a microphone 35 which receives the audio signal from the speaker outlet of the telephone handset, and converts this to an electronic signal. The electronic signal is directed to a circuit board 36, including appropriate amplifying circuitry, which is powered by a batteries 38. The output signal from the amplifier is then fed to a more powerful speaker 40. The output from the supplementary speaker 40 is regulated via a user operated volume control (not shown), so that the signal is audible to the user at a range of several feet. It will be seen from the drawing that the supplementary speaker 40 is disposed at an angle, such that, in use, the audio signal is directed toward the user. It will also be appreciated that the speaker is directed away from the microphone, so as to reduce feedback or howling. The maximum volume of the speaker is also limited for the same reason. If necessary, a digital delay circuit can be provided to introduce a delay of, say, 0.1 seconds between the signal received from the microphone and the signal fed to the supplementary speaker, again to reduce feedback. This embodiment of the invention has the advantage of avoiding the need for the acoustic tube and earpiece as used in the previous embodiments.

The collapsible nature of the clamping mechanism and the handset support mean that they are both readily portable. In the preferred form of the invention, the handset support folds flat and may easily be carried in, say, a pocket or a purse. The acoustic adaptor is also easily carried when collapsed particularly in the form with the strap

fastener mechanism. The compact nature of the invention in its collapsed state is particularly important where the system will be moved frequently from car to car.

Another advantage offered by the invention, at least in preferred forms, is that it may be used on either side of a vehicle, simply by reversing the orientation of the handset and the acoustic adaptor on the handset support unit. Thus, the handset can always be placed or clamped onto the support unit in the correct orientation, irrespective of whether the support is on the left or right hand side of the vehicle.

The apparatus can be formed from any number of materials. In a preferred forms, the whole device as well as the handset support is formed from sheet metal which is painted or powder coated. However, moulded plastics or any other suitable material may be used as desired.

Although the invention has been described with reference to a particular embodiment, it will be appreciated by those skilled in the art that the invention may be embodied in many different forms.

CLAIMS:-

1. An adaptor to allow remote use of a telephone handset, said adaptor including clamping means to releasably clamp an audio receptor adjacent a speaker outlet on a telephone handset, and audio signal transmission means terminating in a remote earpiece or speaker, such that, in use, sound from said speaker outlet is transmitted to said remote earpiece or speaker, and wherein said adaptor is at least partially collapsible to facilitate storage and transportation.

2. An adaptor to allow remote use of a telephone handset according to claim 1, wherein the adaptor is configured for releasable engagement with a handset support unit including a platform for the handset and hook means to engage a space between an inner surface of a window and an inner seal associated therewith such that the platform rests on an inner window sill.

3. An adaptor to allow remote use of a telephone handset according to claim 2, wherein the adaptor is releasably attachable to the handset support by means of hook and loop fastening.

4. An adaptor to allow remote use of a telephone handset according to claim 2 or claim 3, wherein the hook means include a tab hingedly mounted to an edge of the platform, said tab being adapted for limited rotation between a collapsed position resting against the platform for storage, and an operative position wherein further rotation is prevented such that, in use, the platform extends inwardly from the inner surface of the window.

5. An adaptor to allow remote use of a telephone handset according to any one of claims 1 to 4, wherein the audio receptor includes a cup formation adapted for

engagement with the speaker outlet, and wherein the audio signal transmission means comprise an acoustic tube extending from the cup formation to the earpiece.

6. An adaptor to allow remote use of a telephone handset according to any one of the preceding claims, wherein the clamping means comprise a generally 'C'-shaped bracket, having a pair of arms adjustable in spacing to accommodate handsets of different size.

7. An adaptor to allow remote use of a telephone handset according to claim 6, wherein one of the arms of the 'C'-shaped bracket is slidably adjustable with respect to the other, and is held in selected positions by a fastening assembly.

8. An adaptor to allow remote use of a telephone handset according to claim 7, wherein the fastening assembly includes a grub screw.

9. An adaptor to allow remote use of a telephone handset according to any one of claims 1 to 7, wherein the adaptor includes spring loaded clamping means.

10. An adaptor to allow remote use of a telephone handset according to any one of claims 1 to 5, wherein the clamping means include a flexible strap adapted to wrap around the telephone handset and thereby releasably to retain the audio receptor in engagement with the handset.

11. An adaptor to allow remote use of a telephone handset according to claim 10, wherein the ends of the ends of the clamping strap are joinable by fastening means.

12. An adaptor to allow remote use of a telephone handset according to claim 11, wherein the fastening means include hook and loop fastening material.

13. An adaptor to allow remote use of a telephone handset according to claim 12, wherein the strap is configured simultaneously to retain the audio receptor in

engagement with the speaker outlet and to retain the telephone handset in engagement with the support unit.

14. An adaptor to allow remote use of a telephone handset according to any one of the preceding claims, wherein the adaptor is formed substantially from a rigid sheet material.

15. An adaptor to allow remote use of a telephone handset according to any one of the preceding claims, wherein said adaptor folds flat or is otherwise collapsible, to facilitate handling and transportation when not in use.

16. An adaptor to allow remote use of a telephone handset according to any one of the preceding claims, wherein the adaptor can be placed on a substantially flat surface.

17. An adaptor to allow remote use of a telephone handset according to any one of claims 6 to 8, wherein one or both arms of said bracket may be hinged so as to fold into an overlapping relationship.

18. An adaptor to allow remote use of a telephone handset according to any one of claims 1 to 4, wherein the audio receptor includes a cup formation adapted for engagement with the speaker outlet, and wherein the signal transmission means include a microphone disposed within the cup formation to receive the audio signal from the speaker outlet, processing circuitry to convert the audio signal to an electronic signal, an amplifier to amplify the electronic signal and to generate a corresponding output signal, and a speaker connected to receive the output signal and generate an audio signal audible to a user remote from the handset.

19. An adaptor to allow remote use of a telephone handset, substantially as herein described with reference to any one of the embodiments of the invention shown in the accompanying drawings.

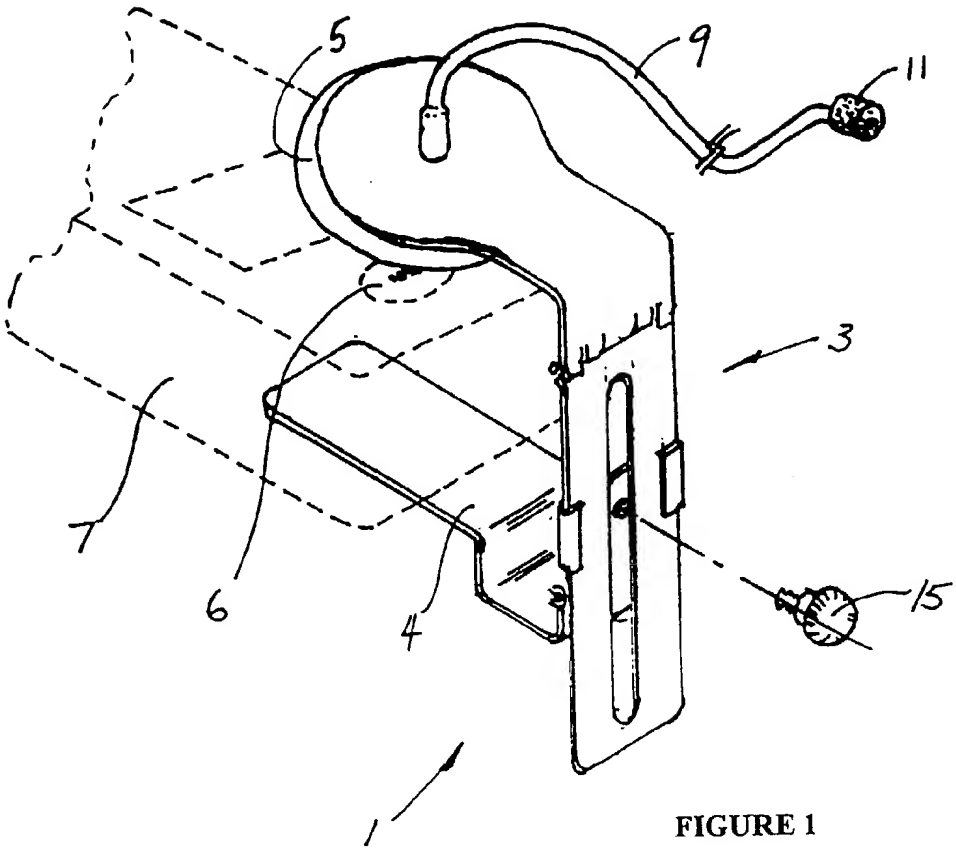

FIGURE 1

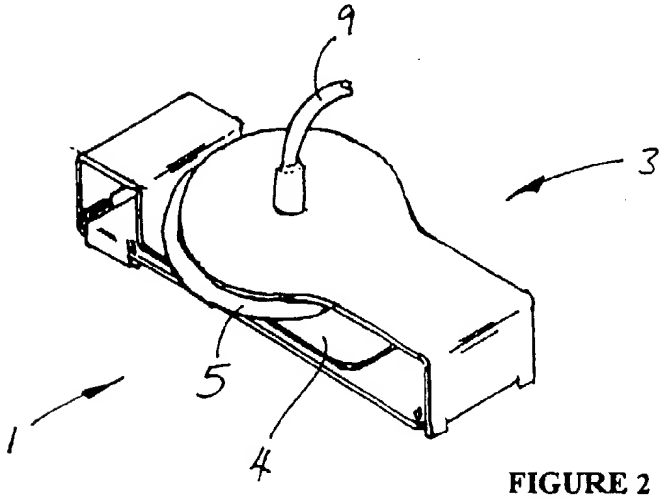

FIGURE 2

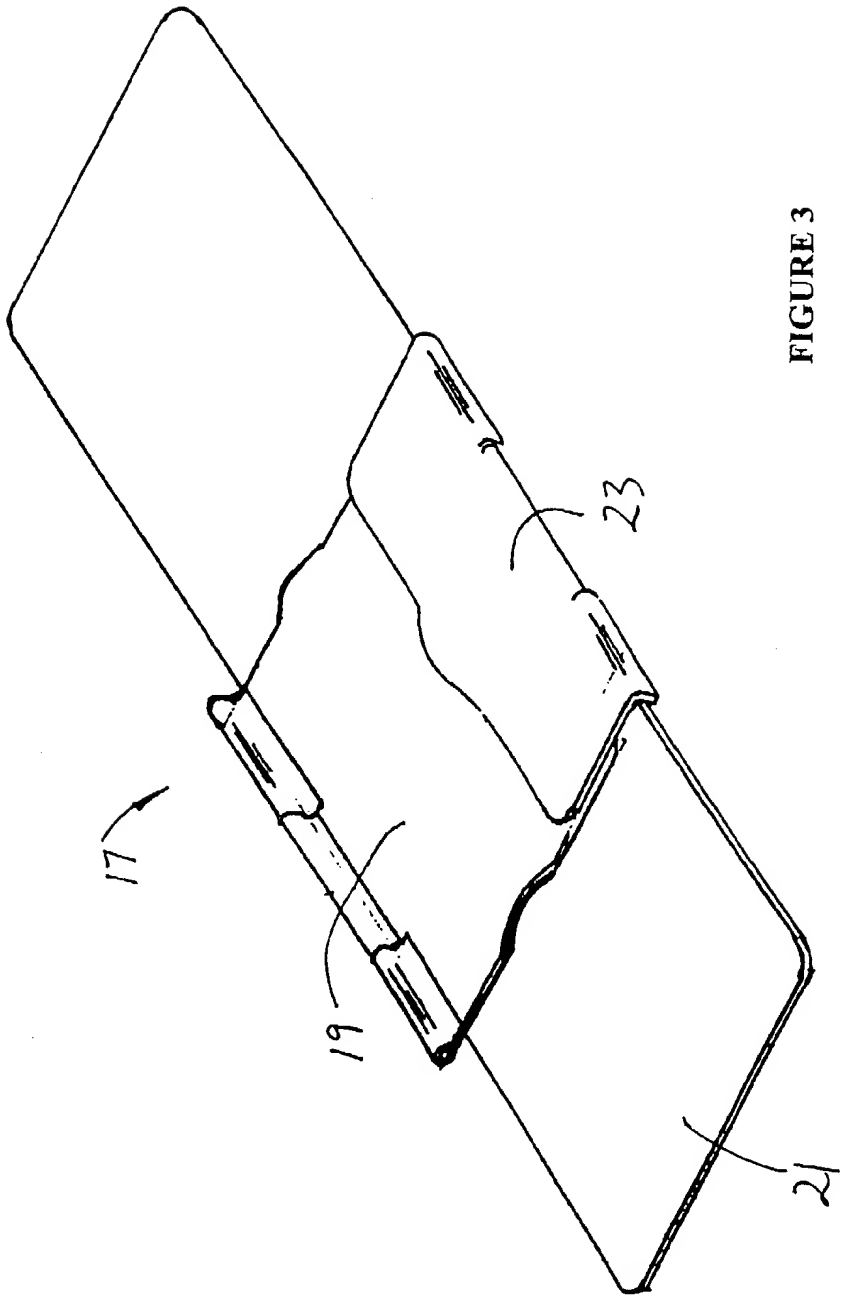

FIGURE 3

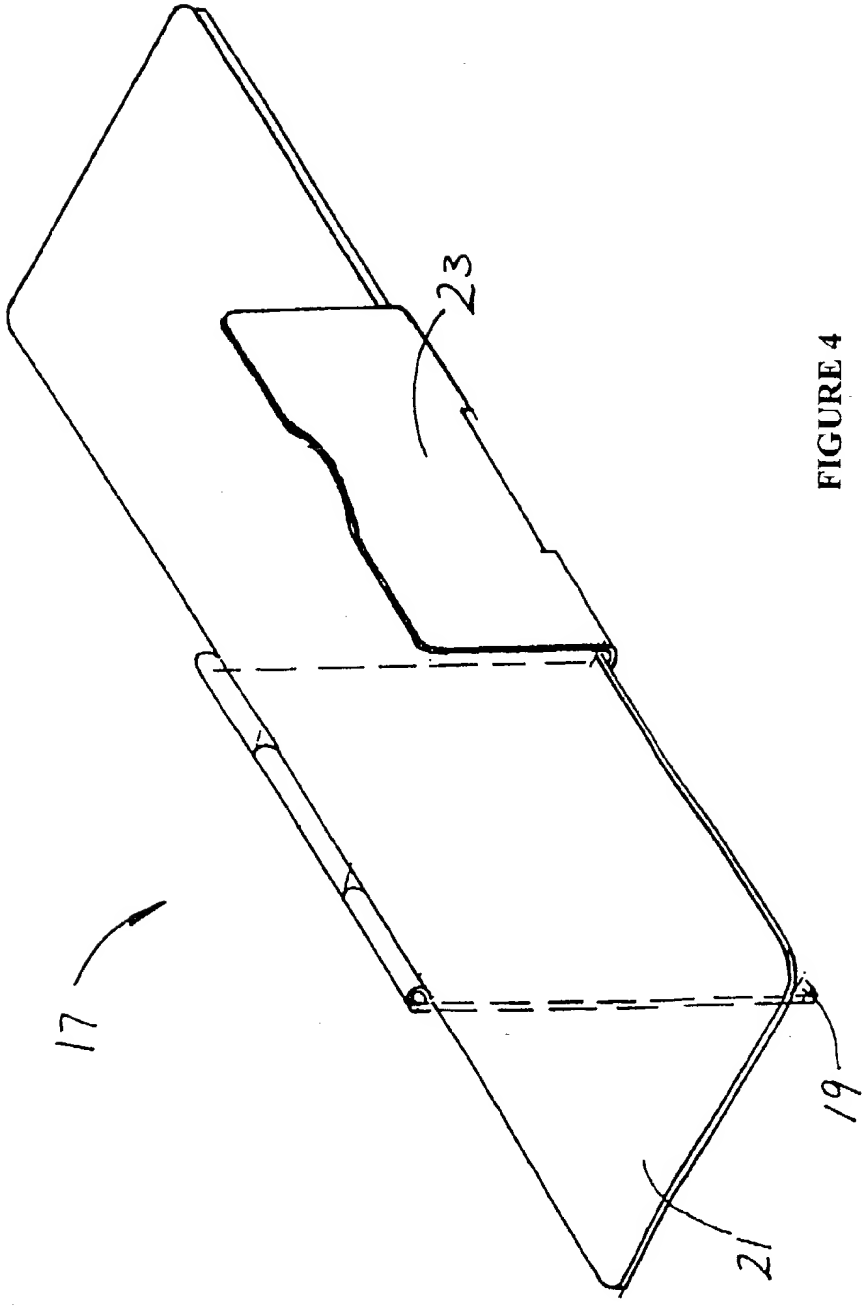

FIGURE 4

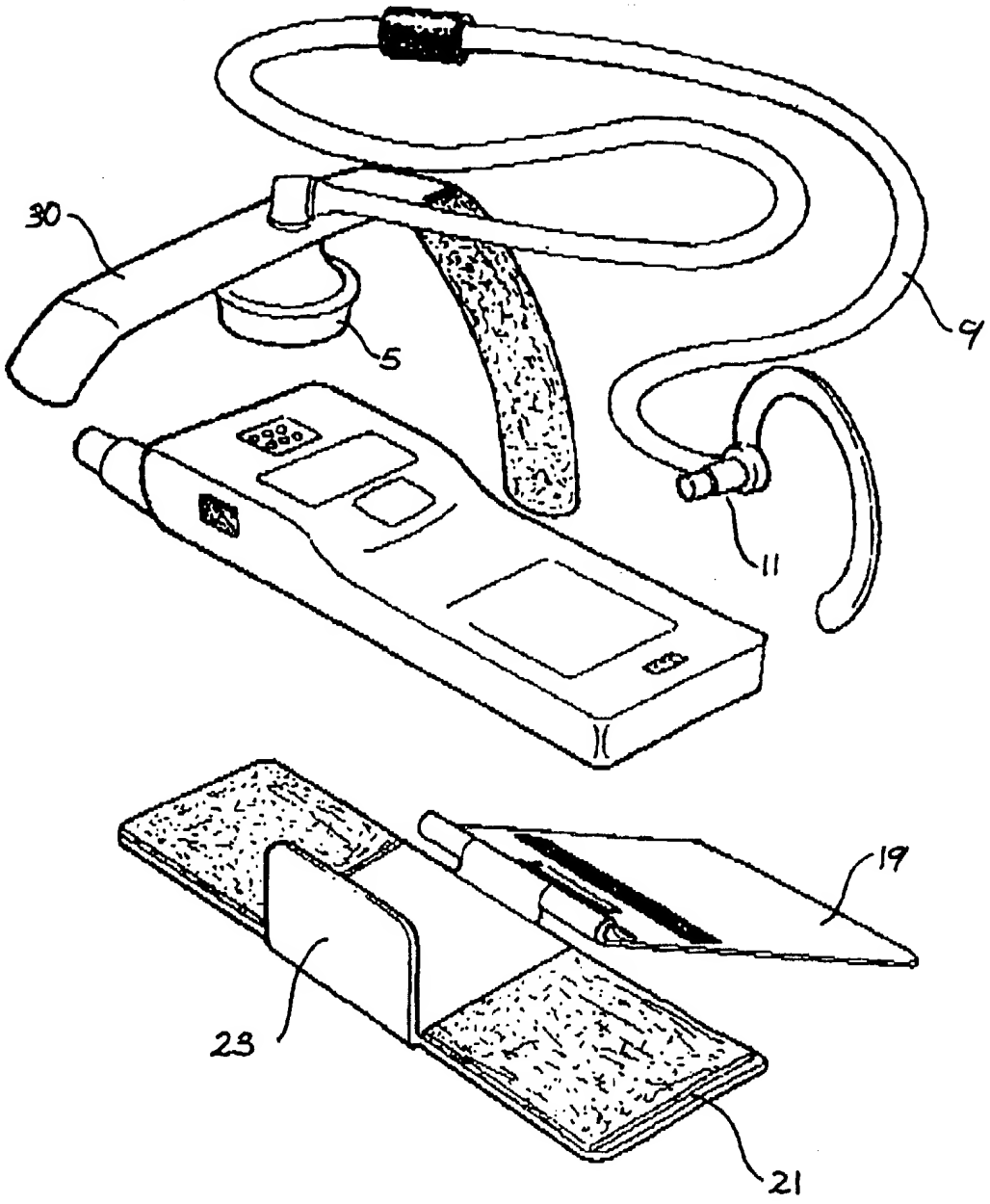

FIGURE 5

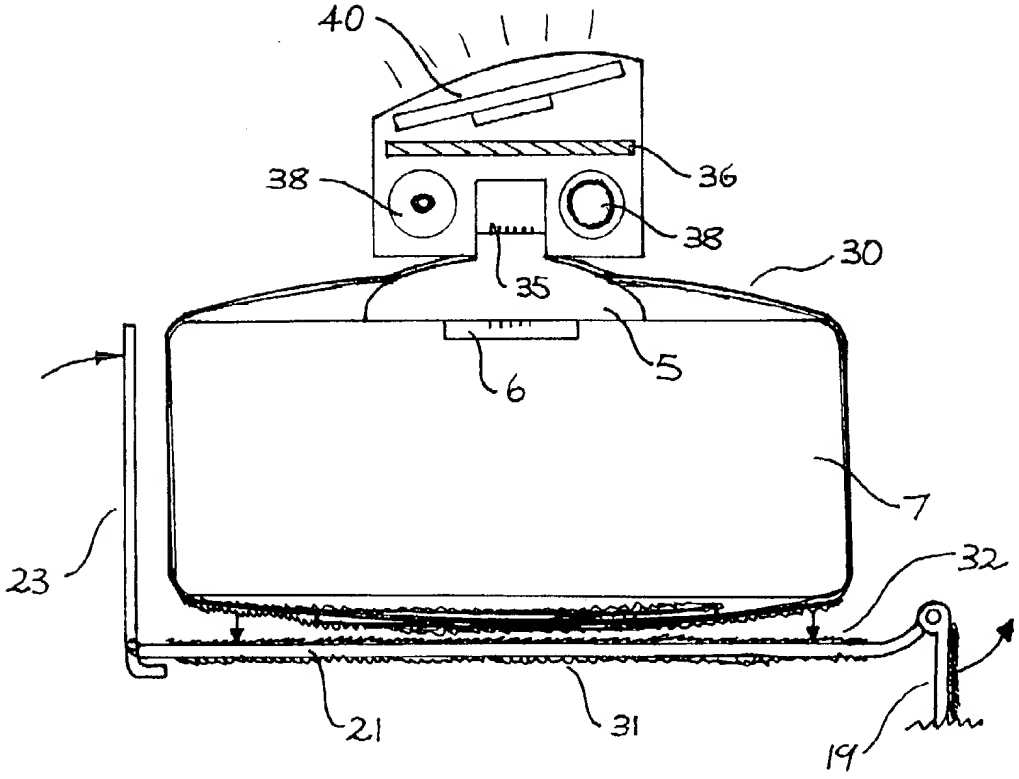

FIGURE 6

INTERNATIONAL SEARCH REPORT

International Application No.
PCT/AU 97/00756

A. CLASSIFICATION OF SUBJECT MATTER

Int Cl[6]: H04M 1/04, 1/06

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC : H04M 1/04, 106, 1/11, 1/12

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched
AU : IPC as above

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
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C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
	WO 97/14582 A1 (WHITBY) 24 April 1997	
P,X	Fig. 1; page 1 - page 8	1-10, 13-19
P,Y	Fig. 1; page 1 - page 8	11, 12
	US 5471530 A (CHEN) 28 November 1995	
X	Fig. 5; column 1 line 57 - column 4 line 4	1-10, 13-19
Y	Fig. 5; column 1 line 57 - column 4 line 4	11, 12

[X] Further documents are listed in the continuation of Box C

[X] See patent family annex

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INTERNATIONAL SEARCH REPORT

International Application No.
PCT/AU 97/00756

C (Continuation) **DOCUMENTS CONSIDERED TO BE RELEVANT**

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
	GB 2262410 A (PROGREX INTERNATIONAL CO. LTD.) 16 June 1993	
X	Figs. 5 and 6; page 9 line 1 - page 10 line 8	1-10, 13-19
Y	Figs. 5 and 6; page 9 line 1 - page 10 line 8	11, 12
	Derwent abstract accession no. 91-359666/49, Class WO 1, SE 9000740 A (JONDELIUS) 2 September 1991	
X	Abstract	1-10, 13-19
Y	Abstract	11, 12
	GB 2241132 A (TECHNOPHONE LTD) 21 August 1991	
X	Page 2 line 8 - page 3 line 9	1-10, 13-19
Y	Page 2 line 8 - page 3 line 9	11, 12
	FR 2709048 A1 (HOUSSET) 24 February 1995	
Y	Figs. 1-3; pages 1-2	11, 12

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No.
PCT/AU 97/00756

This Annex lists the known "A" publication level patent family members relating to the patent documents cited in the above-mentioned international search report. The Australian Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

Patent Document Cited in Search Report		Patent Family Member			
WO	97/14582	AU	72069/96		
US	5471530	GB	2294176		
GB	2241132	EP	447715	US	5301224

END OF ANNEX